AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Cancelled)

2. (Previously presented) The method of claim 17 wherein said nanoparticles comprise at least one of the following: C, Si, Ge, CuCl, CuBr, CuI, AgCl, AgBr, AgI, Ag_2S, CaO, MgO, ZnO, $Mg_xZn_{1-x}O$, ZnS, HgS, ZnSe, CdS, CdSe, CdTe, HgTe, PbS, BN, AlN, GaN, $Al_xGa_{1-x}N$, GaP GaAs, GaSb, InP, InAs, $In_xGa_{1-x}As$, SiC, $Si_{1-x}Ge_x$, Si_3N_4, ZrN, CaF_2, YF_3, Al_2O_3, SiO_2, TiO_2, Cu_2O, Zr_2O_3, ZrO_2, SnO_2, YSi_2, $GaInP_2$, Cd_3P_2, Fe_2S, Cu_2S, $CuIn_2S_2$, MoS_2, In_2S_3, Bi_2S_3, $CuIn_2Se_2$, In_2Se_3, HgI_2, PbI_2 and their various isomers and alloys.

3. (Previously presented) The method of claim 17 wherein said nanoparticles are in spherical, cubical, rod-like, tetragonal, single or multi-wall nano-tube or other nano-scale geometric shapes.

4. (Previously presented) The method of claim 17 wherein said nanoparticles are immersed in polymer matrix or other chemicals.

5. (Previously presented) The method of claim 17 wherein the nanoparticles are doped with other elements.

6. (Previously presented) The method of claim 17 wherein the nanoparticles are coated with other semiconductors or chemicals.

7. (Currently amended) The method of claim ~~[[17]]~~ 22 further including using said bleachable enhancement layer to create images or patterns with higher resolution than the diffraction limit allows.

8. (Previously presented) The method of claim 17 further including separating photo-generated electrons and holes in said nanoparticles.

9. (Previously presented) The method of claim 17 further including providing carrier accepting surface states in said nanoparticles.

10. (Previously presented) The method of claim 17 further including providing chemical surfactant at the surface of said nanoparticles.

11. (Previously presented) The method of claim 17 wherein said nanoparticles comprise plural types of nanoparticles with different band-gaps.

12. (Previously presented) The method of claim 17 wherein said nanoparticles have a bandgap, and the method further includes providing, at the surface of said nano-particles, a semiconductor coating with a band-gap different from the band-gap of said nanoparticles .

13. (Previously presented) The method of claim 17 wherein said nano-particles include a n-type nano-particle within a p-type polymer matrix.

14. (Previously presented) The method of claim 17 wherein said nanoparticles comprise at least one p-type nanoparticle within an n-type polymer matrix.

15. (Previously presented) The method of claim 17 wherein said nanoparticles comprise n-type nano-particle or p-type nano-particles in a non-doped polymer matrix.

16. (Previously presented) The method of claim 17 further including inducing Auger recombination of multiple electron and hole pairs in said nano-particles.

17. (Currently Amended) A method of exposing a semiconductor wafer having at least a photoresist thereon, said method comprising:

disposing said photoresist onto ~~the surface of a~~ said semiconductor wafer;

~~providing~~coating, on top of said photoresist, a contrast enhancement layer comprising a reversible photo bleachable material including nanoparticles;

providing a light source;

illuminating at least one mask with said light source;

~~passing light from said light source through at least one mask;~~

collecting ~~[[said]]~~ light passing through said at least one mask and creating at least one light pattern ~~on said photoresist~~;

said at least one light pattern ~~or light patterns~~ at least in part photobleaching said contrast enhancement layer, said nanoparticles providing at least part of said photobleaching;

said at least one light pattern exposing said photoresist after passing through said contrast enhancement layer.

18. (Cancelled)

19. (Original) The method of claim 17 wherein said illuminating comprises providing multiple exposures separated in time.

20. (Currently Amended) The method of claim 19 further including allowing said ~~[[R-CEL]]~~reversible contrast enhancement layer to relax between at least some of said multiple exposures.

21. (Original) The method of claim 17 wherein said illuminating comprises providing multiple different exposure patterns separated in position on said substrate.

22. (Original) The method of claim 21 further including allowing said nano-particles to relax between at least some of said multiple exposures.

23. (Currently Amended) The method of claim 17 wherein said illuminating ~~[[step]]~~ comprises using a programmable mask.

24. (Original) The method of claim 23 further including reprogramming said programmable mask to provide at least first and second different exposure patterns, and allowing said nano-particles to at least partially relax after exposure with said first pattern and before exposure with said second pattern.

25. (Currently Amended) The method of claim 17 wherein said illuminating ~~step~~ comprises using multiple fixed masks.

26. (Currently Amended) The method of claim 17 ~~wherein said~~further including performing said exposing ~~process is carried out~~ in liquid-immersion or solid-immersion.

27. (Currently Amended) The method of claim 17 wherein said ~~providing mechanism~~coating includes spinning~~, spraying, rinsing, dipping, precipitation, evaporation and other thin-film deposit mechanisms~~.

28. (Original) The method of claim 17 wherein said reversible photo bleachable material comprise plural different types of nano-particles.

29. (Original) The method of claim 17 wherein said reversible photo bleachable material comprise multiple layers containing nano-particles.

30. (Cancelled).

31. (Cancelled).

32. (Cancelled)

33. (Cancelled)

34. (Cancelled)

35. (Cancelled).

36. (Previously presented) The method of claim 17 further including further processing said photoresist to at least in part define at least one structure on said semiconductor wafer.

37. (Previously presented) The method of claim 17 further including reversing said bleaching of said contrast enhancement layer.

38. (Previously presented) The method of claim 17 further including tuning the absorption edge of said nanoparticles by specifying the size of said nanoparticles.

39. (Previously presented) The method of claim 17 wherein said illuminating comprises illuminating said layer with light having a wavelength of 365 nm or shorter.

40. (Previously presented) The method of claim 17 wherein said illuminating comprises illuminating said layer with light having a wavelength of 193 nm.

41. (Previously presented) The method of claim 17 wherein said illuminating comprises illuminating said layer with light having a wavelength of 248 nm.

42. (Previously presented) The method of claim 17 wherein said illuminating comprises illuminating said layer with light having a wavelength of 157 nm.

43. (Previously presented) The method of claim 17 further including using said nanoparticles to resolve light distribution with high spatial frequency.

44. (Previously presented) The method of claim 17 wherein said nanoparticles comprise semiconductor nanoparticles.

45. (Previously presented) The method of claim 17 wherein said nanoparticles include Aluminum Nitride nanoparticles.

46. (Previously presented) The method of claim 17 wherein said nanoparticles include Aluminum Nitride alloys.

47. (Previously presented) The method of claim 17 wherein said nanoparticles include Aluminum Nitride isomers.

48. (Previously presented) The method of claim 17 wherein said nanoparticles have electronic structures exhibiting a band-gap.

49. (New) The method of claim 17 wherein said collecting includes passing said light through at least one lens.

50. (New) The method of claim 17 wherein coating includes spraying.

51. (New) The method of claim 17 wherein coating includes dipping.

52. (New) The method of claim 17 wherein coating includes precipitating.

53. (New) The method of claim 17 wherein coating includes evaporation.

54. (New) The method of claim 17 wherein coating includes rinsing.

55. (New) The method of claim 17 wherein coating includes a thin film deposition.

56. (New) The method of claim 17 wherein coating includes at least two of spinning, spraying, dipping, precipitating, evaporation, rinsing, and thin film deposition.

57. (New) the method of claim 19 wherein said illuminating comprises illuminating with light having a wavelength of 157 nm.

58. (New) the method of claim 19 wherein said illuminating comprises illuminating with light having a wavelength of 193 nm.

59. (New) the method of claim 19 wherein said illuminating comprises illuminating with light having a wavelength of 248 nm.

60. (New) the method of claim 19 wherein said illuminating comprises illuminating with light having a wavelength of 365 nm.

61. (New) the method of claim 21 wherein said illuminating comprises illuminating with light having a wavelength of 157 nm.

62. (New) the method of claim 21 wherein said illuminating comprises illuminating with light having a wavelength of 193 nm.

63. (New) the method of claim 21 wherein said illuminating comprises illuminating with light having a wavelength of 248 nm.

64. (New) the method of claim 21 wherein said illuminating comprises illuminating with light having a wavelength of 365 nm.

65. (New) the method of claim 22 wherein said illuminating comprises illuminating with light having a wavelength of 157 nm.

66. (New) the method of claim 22 wherein said illuminating comprises illuminating with light having a wavelength of 193 nm.

67. (New) the method of claim 22 wherein said illuminating comprises illuminating with light having a wavelength of 248 nm.

68. (New) the method of claim 22 wherein said illuminating comprises illuminating with light having a wavelength of 365 nm.

69. (New) the method of claim 26 wherein said illuminating comprises illuminating with light having a wavelength of 157 nm.

70. (New) the method of claim 26 wherein said illuminating comprises illuminating with light having a wavelength of 193 nm.

71. (New) the method of claim 26 wherein said illuminating comprises illuminating with light having a wavelength of 248 nm.

72. (New) the method of claim 26 wherein said illuminating comprises illuminating with light having a wavelength of 365 nm.

73. (New) the method of claim 20 wherein said illuminating comprises illuminating with light having a wavelength of 157 nm.

74. (New) the method of claim 20 wherein said illuminating comprises illuminating with light having a wavelength of 193 nm.

75. (New) the method of claim 20 wherein said illuminating comprises illuminating with light having a wavelength of 248 nm.

76. (New) the method of claim 20 wherein said illuminating comprises illuminating with light having a wavelength of 365 nm.

77. (New) the method of claim 7 wherein said illuminating comprises illuminating with light having a wavelength of 157 nm.

78. (New) the method of claim 7 wherein said illuminating comprises illuminating with light having a wavelength of 193 nm.

79. (New) the method of claim 7 wherein said illuminating comprises illuminating with light having a wavelength of 248 nm.

80. (New) the method of claim 7 wherein said illuminating comprises illuminating with light having a wavelength of 365 nm.